REMARKS

Claims 25, 26, 28-32, 36 and 40-46 are pending.

I. More clarification of the operation and structure of the microscope is provided for the Examiner's convenience and to explain the technology more clearly.

Applicant apologizes for not explaining certain points sooner, but upon an additional detailed review of the operation the microscope, applicant submits the following to clarify the invention overall. It is respectfully believed that once the following is explained, the Examiner will no longer have any 112 issues, and also in general, the entire purpose, structure, and function of the invention will be much clearer and the claims should be allowable.

a. Widely used microscopy illumination methods.

In microscopy, especially when viewing samples like bacteria, there is an illumination method called "dark field" illumination microscopy which is widely known and which greatly improves contrast (see the attached glossary of microscopy terms). Dark field illumination is defined as: "dark field illumination: any method of illumination which illuminates the specimen but which does not admit light directly to the objective."

In one known arrangement of "dark field illumination microscopy," an opaque stop is used to create a peripheral cone of light so that only peripheral light refracted from the specimen will enter the objective. This improves contrast and is a widely known. (see also a diagram of titled "Principles of dark Field Microscopy")

Therefore, the above discussion clearly demonstrates that it is widely known, and therefore it is possible, to have a dark field illumination, ***where substantially no direct reflected light is incident on the objective or observation channels and that this dark field method is widely used.*** Therefore, the overall point to be made is that the Examiner should not get hung up conceptually

by erroneously believing that a microscope cannot function without some kind of regular "bright field" illumination to illuminate the sample. In fact, dark field illumination and oblique (at an angle) illumination, are all standard and widely known illumination methods see for example, "An example of dark-field, oblique, and bright field illumination" which all have effects on the contrast and image generated. Additionally, it is important to keep in mind the distinction that "scattered light" is not generally regarded as "directly reflected" per se in the art.

It is respectfully asserted that once the above background concepts are understood and accepted by the USPTO the present invention should be much easier to understand as discussed below.

b. The present invention ***results in many of the benefits of dark field microscopy and also oblique microscopy techniques but uses a modified bright field illumination arrangement that is compact and does not require the use of polarizers or external light sources.***

Thus, it is important to remember that the present invention uses a modified form of "bright field" illumination according to the description of Figure 4, i.e.,

"Fig. 4 shows that the two light guide ends provided with focussing optics form an angle to the optical axis of the microscope and accordingly advantageously overlap with respect to illumination spots BS so that ***a uniform bright illumination of the object*** in the object plane OE is achieved over the entire maximum object field."

Therefore, the present invention uses a form of modified "bright field" illumination the net result is that benefits similar to "dark field illumination" or "oblique illumination" are gained to the user. This is because the illumination angle used by the present invention keeps most of the direct reflection from entering the optics.

Therefore, the above discussion should clarify what seems to be a central outstanding question of the USPTO, namely, as stated on 3 of the final rejection:

> "Claims 40 and 46 include virtually the same structural limitations. Accordingly, it is unclear how the structural features of claim 46 can produce an observed image since it does not function via fluorescence."

Thus, if a sample is florescent sample, then obviously the florescent light will form an image in the optics given the fact that the illumination light is incident at such an angle that all, or almost all, of the illumination light is not directly reflected into the objective(s) or observation channels. However, also to answer the USPTO's question above, if the sample is not fluorescent, like a semi-conductor sample for example, then it also equally true and straightforward that the presently claimed manner of illumination can illuminate the specimen -- i.e., it is possible -- and it does generate a largely reflection free image, just as it is possible generate an image in traditional oblique illumination, (i.e., it is possible to generate an oblique illumination image or a dark field illumination image for example). So, in other words, if the USPTO's reasoning was correct that would mean that oblique illumination and dark field illumination would also be conceptually or structurally impossible, and of course in reality these are widely used illumination methods.

Again for example, "dark field illumination is defined as: "dark field illumination: any method of illumination which illuminates the specimen but which does not admit (reflected illumination) light directly to the objective."

In fact, applicant works for the renowned optical company, Zeiss (the assignee), which uses such techniques (dark field, oblique) to illuminate specimens.

Therefore hopefully any confusion about how "the sample" could somehow matter to the language of the claims (it doesn't) or the general operation of the microscope in either florescent mode, or using some tiny bit of visible illumination light to obtain an effect like a dark field or oblique illumination method, should have been clarified by the above discussion and examples. Again, essentially the present microscope can be loosely thought of providing an image which looks somewhat like a dark field image with improved contrast, but it is a modified bright field illumination microscope, almost is some ways like an oblique illumination microscope. This is all discussed in the specification, but it may be much harder to understand without knowledge of the above background information and the knowledge of one skilled in the art.

Therefore, the 112 questions should be traversed. If the Examiner has any further questions about the operation or structure of the microscope, he is respectfully urged to telephone applicants

attorney below to discuss the issues further. However, everything is straightforward as discussed above.

II. The new 103 rejection of independent claim 40 at page 4 of the final rejection.

It is noted that Applicant has already made the arguments below in the in applicant's amendment filed March 29, 2002 (see pages 3-5). Thus, these are not new arguments that require or trigger a new search.

The USPTO makes the new argument from the Figures of Siersch that "no direct reflection of light falls into the observation channels" in Siersch because the USPTO states that the directly reflected light would go into an "opposite illumination channel" and this would purportedly disclose or teach the claimed limitations of "no direct reflection of light falls into the observation channels." This is respectfully incorrect, and the fact is that a substantial amount of direct reflected illumination light enters the observation channels of Siersch as shown in all the figures of Siersch (see the arrows, wherein no arrow returns to illumination optics 14, 17 (fig. 1) 14,18 (fig.2), 14,16, 21 (fig. 3), 12, 13 (fig. 4) for example). Applicant notes that this arrangement creates major problems for image formation with specimens that are "reflective" specimens (as opposed to diffuse specimens). In any event, the Siersch reference is in the German language, and the figures of Siersch show that the illumination light is reflected back into the observation optics is a brightfield manner. So this new rejection respectfully appears to be the Examiner's own theory based on "the law of reflection" and it is respectfully asserted to be incorrect. Therefore, according to MPEP 2144.03 if the Examiner uses his own personal knowledge to support a rejection, a statement of official notice or an affidavit of the Examiner must be provided. Again as the figures contradict what is alleged by the Examiner's assertion, and as the reference is in German, it is clear that the reference alone does not support the rejection as respectfully alleged. Therefore, additional references or the above measures of "Official Notice," affidavit of the Examiner, etc. must be taken.

Therefore, the rejection is respectfully traversed.

The remaining claims depend from claim 40 (the numbering is out of order now). Therefore,

these claims are also respectfully asserted to be allowable.

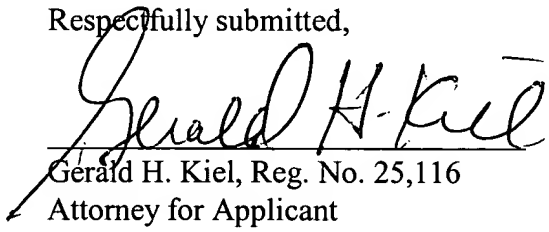
Applicant also respectfully thanks the Examiner for holding an interview wherein operation of the claimed device and the cited reference, Siersch, was discussed.

Overall, applicant respectfully believes that once the USPTO understands the technical points made above regarding illumination methods that all of the claims should be allowable.

III. Conclusion.

In light of the *FESTO* case, no argument or amendment made herein was related to the statutory requirements of patentability unless expressly stated herein. No claim amendment or argument made was for the purpose of narrowing the scope of any claim unless Applicant has explicitly stated that the argument is "narrowing." It is respectfully requested that all of the claims be reconsidered and allowed. An early and favorable action on the merits is respectfully requested.

Respectfully submitted,



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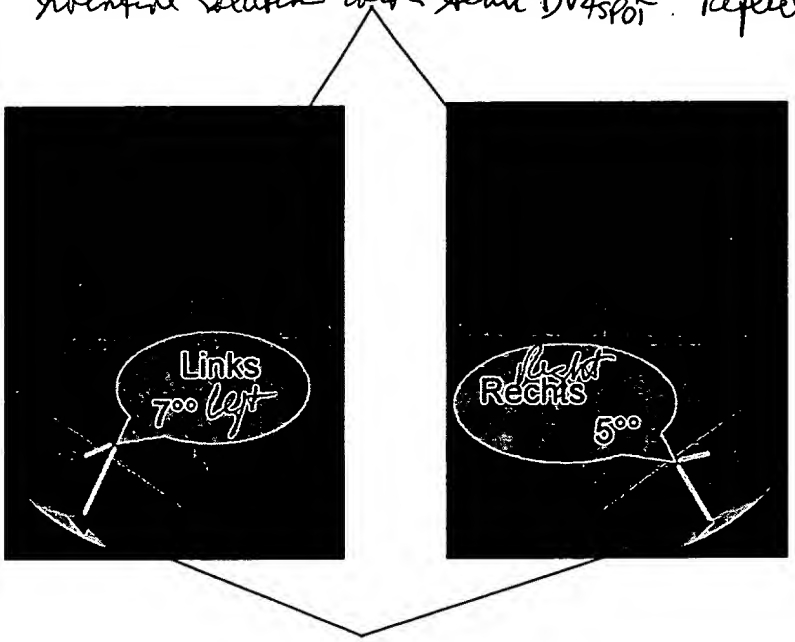
Photographed Stereo Microscope – Observed – Field with Mirror Object Plane

Fotografiert Stereomikroskop - Sehfelder bei spiegelnder Objektebene:

Erfinderische Lösung beim **Stemi DV4$_{SPOT}$**: Reflexfreie (dunkle !) Spiegeloberfläche

Inventive Solution with Stemi DV4$_{SPOT}$: Reflection-free (dark!)

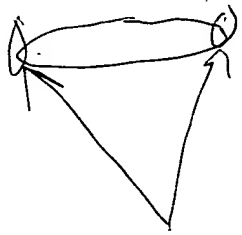
mirror copper surface



Direkter Reflex (diffuses SPOT - Bild) nur am äußersten Sehfeldrand des linken und rechten Kanals bei maximal möglichen Objektfelddurchmesser

MG-ES (CZJ) / JKn

Directly Reflected (diffused SPOT-image) only at the outermost Observation field edge of the left and right channel with maximum possible object field diameter

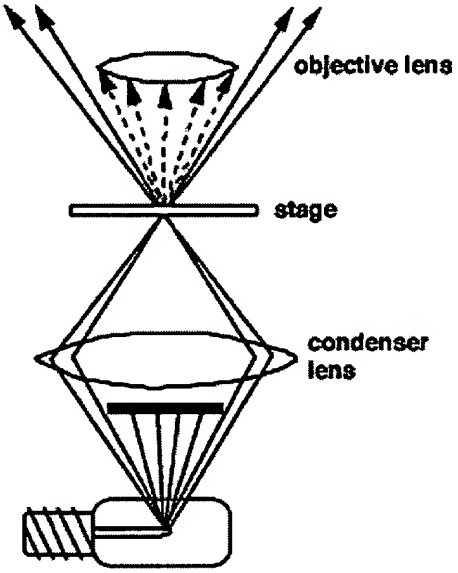


dark field

Dark Field Microscopy

Principles of Dark Field Microscopy

To view a specimen in dark field, an opaque disc is placed underneath the condenser lens, so that only light that is scattered by objects on the slide can reach the eye (figure 2). Instead of coming up through the specimen, the light is reflected by particles on the slide. Everything is visible regardless of color, usually bright white against a dark background. Pigmented objects are often seen in "false colors," that is, the reflected light is of a color different than the color of the object. Better resolution can be obtained using dark as opposed to bright field viewing.

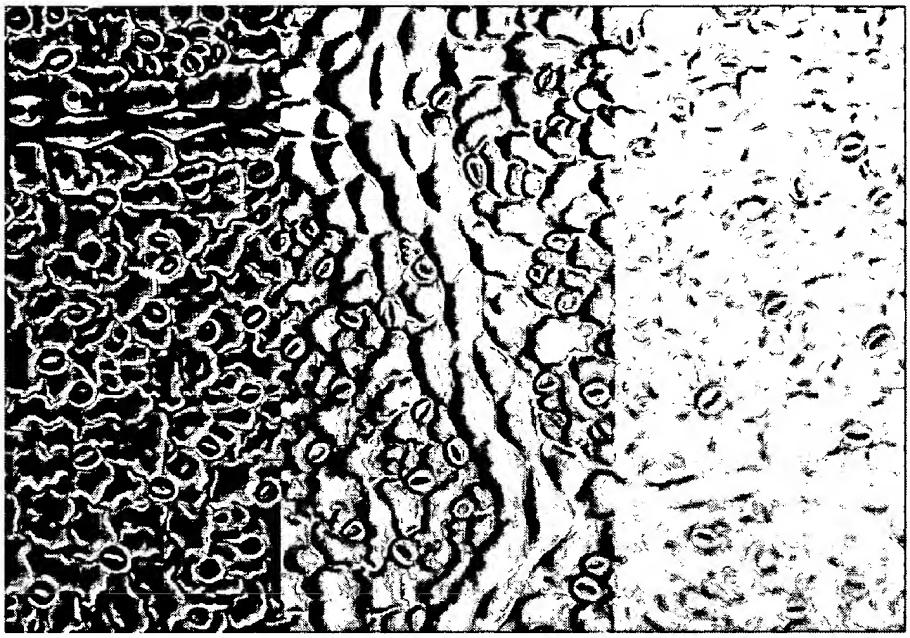


Sophisticated equipment is not necessary to get a dark field effect, but you do need a higher intensity light, since you are seeing only reflected light. At low magnification (up to 100x) any decent optical instrument can be set up so that light is reflected toward the viewer rather than passing through the object directly toward the viewer.

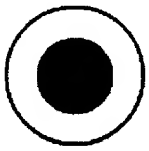
Using a dissecting microscope

An example of dark-field, oblique and bright-field illumination

by Wim van Egmond



dark-field illumination



oblique illumination

bright-field illumination

This image of the surface of a leaf shows the differences in contrast between these types of illumination. Bright-field illumination has very limited contrast. This image clearly shows that it is very useful to experiment with contrast techniques.

Oblique illumination gives a relief-like enhancement of contrast. In 19th century microscopes there was often an arrangement for oblique illumination. Early microscopists knew that this technique has great advantages!

Dark-field illumination is also one of the most rewarding techniques. Objects smaller than the resolving power of the objective can also made visible simply because they light up! It is thought that Antony van Leeuwenhoek observed bacteria using a kind of dark-field illumination!

The image on this page is of a cast of the surface structure of a leaf complete with nerves and stomata. With the aid of nail varnish it is easy to make perfect casts. Read more about this technique next month!